IN THE CLAIMS:

The following listing of claims replaces all previous listings and versions of claim in this application.

1-15 (Cancelled)

16. (Currently amended) A method for fabricating a semiconductor structure comprising:

providing a substrate ~~having a surface and being made~~ of a material with a substrate surface that ~~provides a typical~~ has surface properties ~~to the surface~~ that substantially prevent or inhibit molecular bonding;

forming an intermediate layer on the substrate surface to provide an intermediate layer surface having intermediate layer peaks and surface properties that substantially prevent or inhibit molecular bonding;

providing a bonding layer on the intermediate layer surface ~~of the substrate~~, wherein the intermediate layer is formed of a material that is substantially more resistant to polishing than the bonding layer;

smoothing the bonding layer by polishing, using the intermediate layer as a polish stop, to provide a surface that is capable of molecular bonding; and

molecularly bonding a further layer to the bonding layer to form the structure.

17. (Original) The method of claim 16 wherein the atypical surface properties comprise at least one of a roughness of more than 0.5 nm rms, or a roughness of at least 0.4 nm rms that is difficult to polish, or a chemical composition that is incompatible with molecular bonding.

18. (Currently Amended) The method of claim 16 ~~which further comprises forming an intermediate layer on the substrate to provide the surface layer having the atypical properties before providing the bonding layer~~, wherein the intermediate layer ~~having a~~ has a thermal conductivity coefficient that is higher than that of the substrate or that is between that of the bonding layer and that of the substrate.

19. (Original) The method of claim 18 wherein the intermediate layer is composed of silicon nitride.

20. (Original) The method of claim 16 wherein the thermal conductivity of the substrate is more than 1 W/cm/K.

21. (Original) The method of claim 16 wherein the substrate material comprises at least one of diamond or aluminum nitride.

22. (Original) The method of claim 16 wherein the bonding layer material comprises at least one of silicon dioxide, silicon nitride, hafnium oxide, zirconium oxide, alumina or yttrium oxide.

23. (Original) The method of claim 16 wherein the further layer is made of a semiconductor material.

24. (Original) The method of claim 23 which further comprises producing at least one of a power component and a radio frequency (RF) component in the further layer.

25. (Currently amended) The method of claim 16 wherein the further layer is a second substrate of a material having ~~a typical~~ surface properties that substantially prevent or inhibit molecular bonding.

26. (Original) The method of claim 25 wherein the atypical surface properties of the second substrate comprise at least one of a roughness of more than 0.5 nm rms, or a roughness of at least 0.4 nm rms that is difficult to polish, or a chemical composition that is incompatible with molecular bonding.

27. (Original) The method of claim 25 which further comprises providing a second bonding layer on the second substrate before molecularly bonding.

28. (Original) The method of claim 25 wherein the second substrate comprises at least one of diamond or aluminum nitride.

29. (New) The method of claim 16, wherein the further layer is of a semiconductor material comprising at least one of silicon, germanium, gallium arsenide, silicon-germanium, a semiconductor Group III-Group V material, or a semiconductor Group II-Group VI material.

30. (New) The method of claim 29, wherein further layer is bonded to the bonding layer to form a semiconductor-on-insulator structure.

31. (New) The method of claim 16, wherein the intermediate layer is formed with a roughness that depends on the surface properties of the substrate surface.

32. (New) A method for fabricating a semiconductor structure comprising:

providing a substrate of a material that has a substrate thermal conductivity coefficient and a surface roughness sufficiently elevated to substantially prevent molecular bonding;

forming an intermediate layer on the substrate to provide an intermediate layer surface having intermediate layer peaks and surface properties that substantially prevent or inhibit molecular bonding;

providing a bonding layer on the intermediate layer surface;

smoothing the bonding layer to less than about 10 nm above the intermediate layer peaks to provide a surface that is capable of molecular bonding; and

molecularly bonding a further layer to the bonding layer to form the structure.

33. (New) The method of claim 32, wherein the bonding layer is smoothed by polishing, and the intermediate layer is configured as a smoothing stop to stop the polishing of the bonding layer.

34. (New) The method of claim 32, wherein the intermediate layer having an intermediate layer thermal conductivity coefficient that is higher than the substrate thermal conductivity coefficient.

35. (New) The method of claim 32, wherein the substrate material comprises at least one of diamond or aluminum nitride, and the intermediate layer is of silicon nitride.

36. (New) The method of claim 32, wherein the bonding layer comprises at least one of silicon dioxide, silicon nitride, hafnium oxide, zirconium oxide, alumina, or yttrium oxide.

37. (New) The method of claim 16, wherein the bonding layer is smoothed to a thickness above the intermediate layer peaks.

38. (New) A method for fabricating a semiconductor structure comprising:

providing a substrate having a surface and being made of a material that has surface properties that substantially prevent or inhibit molecular bonding;

providing a bonding layer on the surface of the substrate;

smoothing the bonding layer to provide a surface that is capable of molecular bonding; and

molecularly bonding to the bonding layer a second substrate of a material having surface properties that substantially prevent or inhibit molecular bonding to form the structure.